REMARKS

The Office Action mailed April 9, 2008 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Claim Objections

Claims 2 and 6 have been amended to obviate the objections thereto.

Canceled Claims

Claim 3 has been canceled without prejudice or disclaimer of the subject matter contained therein.

Rejection(s) Under 35 U.S.C. § 102

Claims 1-6 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Tsuji et al. (JP 09308126A).

Claim 1 has been amended to incorporate the limitations of claim 3, which has been canceled. As amended, claim 1 now states that the "control unit controls an output current of said charging current output unit so that the minimum current among the plural bypass currents notified from all of said plural charge controllers is substantially zero."

These limitations are consistent with the description, wherein it is stated that the microcontrollers "set the charge cut-off voltage in the DA converter built into the microcontroller 201 as the bypass start voltage" (p. 10, ll. 2-4); "when the battery voltage of the secondary battery 50 reaches the charge cut-off voltage, an excessive rise in battery voltage is prevented by having any surplus voltage that would further increase battery voltage bypassed" (p. 10, ll. 8-10); "when bypass current begins to flow in all of the charge controllers 200 to which the respective secondary batteries 50 is connected, the charging current from the charge power source unit 100 is reduced <u>by the minimum value of these bypass currents</u>" (p. 10, ll. 13-16; emphasis added).

In accordance with the latter limitation in particular, and as seen in FIGS. 7A and 7B reproduced below, the minimum bypass current (corresponding to "50-1" in FIG. 7A) becomes

substantially zero (FIG. 7B) by the control mechanism of the invention. Specifically, as set forth in the specification, "The microcontroller 101 detects <u>the minimum current value I of the bypass current</u> flowing to the plural charge controllers 200, decreases the output current setting value of the constant current power source 102 by the minimum current portion I, and sets it" (p. 11, l. 24 – p. 12, l. 2; emphasis added).

FIG. 7A

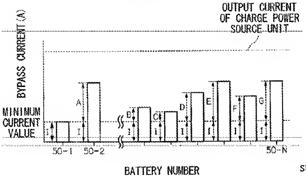
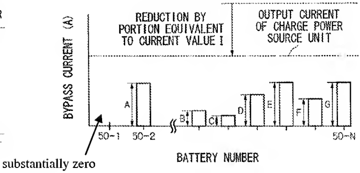


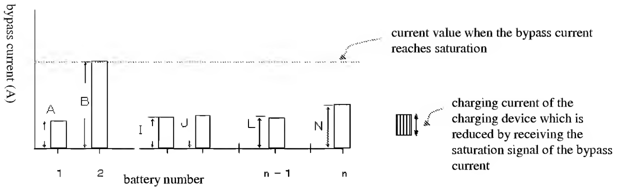
FIG. 7B

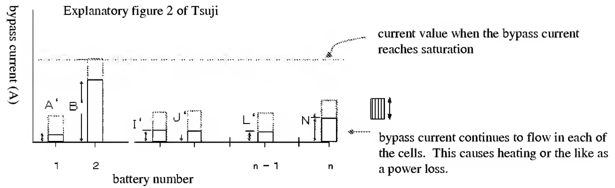


The above features and limitations provide many advantages. For example, as set forth in the specification, the charging device of the invention makes "it possible to ensure the charging current necessary for charging while automatically reducing the charging current" (p. 12, ll. 11-12).

By comparison, and with reference to Explanatory Figures 1 and 2 of Tsuji provided below, it can be seen that Tsuji (JP09308126) teaches that when the bypass current reaches saturation (maximum), the charging current is reduced by a "predetermined value". Therefore, in accordance with the setting of the "predetermined value", the bypass current flows in all the batteries. This leads to a power loss. Also, this situation is maintained until the bypass current of any cells is saturated, that is, the bypass current keeps flowing in all the cells and the power loss continues to occur. In addition, in Tsuji, when the "predetermined value" is set too large, the charging current is not enough in any of the cells. This makes the charging process slow.

Explanatory figure 1 of Tsuji





Accordingly, in the present invention, when the bypass current flows to all the batteries, the current which corresponds to the minimum bypass current value is reduced from the output current of the charging device. While Tsuji can reduce the bypass current value only when the bypass current reaches maximum value, in the present invention, it is possible to reduce the charging current within an allowable current range of a bypass circuit. As a result of this, in the present invention, it is possible to substantially reduce current waste.

As described above, in the present invention, as a result of reducing a current value, which is corresponding to the minimum bypass current value, from the output current of the charging device, it is possible to use a constant current charging device instead of a constant voltage constant current charging device as described in Claim 2. That is, in each of the battery portions, the voltage is controlled to be, for example 4.1V; it is possible to substantially perform charging in the constant voltage constant current charging mode without using a constant voltage charging device. Of course, it is possible to use the constant voltage constant current charging

device, even when the predetermined voltage is mistakenly too high, since it is possible to control the voltage in each of the cells in the assembled batteries, it is safer during charging.

Further, in accordance with claim 2, a direct current, which supplies a predetermined current, can be used without using a constant voltage charging system, in which the charging voltage of the battery is set as an upper limit value, which is usually used in charging normal secondary batteries such as lead battery or the like. That is, by using the direct current, which supplies a predetermined current, not the constant voltage charging system, in which the charging voltage of the battery is set as an upper limit value, it is possible to operate an equivalent to the constant voltage charging system, in which the charging voltage of the battery is set as an upper limit value, by reducing the current value in series. Here, constant voltage charging system, in which the charging voltage of the battery is set as an upper limit value, means, for example, when 2.23V is a decent charging voltage per one unit of the lead battery, the predetermined voltage becomes 2.23 x 23 = 51.29V if 23 units are connected in series as the assembled battery.

It will be appreciated that, according to the M.P.E.P., a claim is anticipated under 35 U.S.C. §102 only if each and every claim element is found, either expressly or inherently described, in a single prior art reference.[1] The aforementioned reasons clearly indicate the contrary, and withdrawal of the 35 U.S.C. §102 rejection based on Tsuji is respectfully urged.

Conclusion

In view of the preceding discussion, Applicants respectfully urge that the claims of the present application define patentable subject matter and should be passed to allowance.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney at the number below.

[1] Manual of Patent Examining Procedure (MPEP) § 2131. See also *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Please charge any additional required fees, including those necessary to obtain extensions of time to render timely the filing of the instant Amendment and/or Reply to Office Action, or credit any overpayment not otherwise credited, to our deposit account no. 50-1698.

Respectfully submitted,
THELEN REID BROWN RAYSMAN & STEINER LLP

Dated: July 8, 2008

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